Docket No.: E0710.0001/P001-A
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Joseph THOMPSON et al.

Application No.: 10/669,465 Confirmation No.: 4570

Filed: September 25, 2003 Art Unit: 2163

For: AUTOMATED CONFIGURATION SYSTEM AND METHOD Examiner: M. Nguyen

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 C.F.R. § 41.37, this brief is being filed within two months of the Notice of Appeal filed on March 8, 2007, and accompanied by the fees required under 37 C.F.R. § 41.20(b)(2).

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

I.	Real Party In Interest
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I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

EDGENET, INC., a corporation organized under and pursuant to the laws of the State of Tennessee, and the assignee of this application.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 21 claims pending in the application. The application contains claims 1-19 and 21, which were finally rejected. This is an appeal from the final rejection of claims 1-19 and 21.

B. Current Status of Claims

1. Claims canceled: None.

2. Claims withdrawn from consideration but not canceled: Claim 20.

3. Claims pending: 1-21.

4. Claims allowed: None.

5. Claims rejected: 1-19 and 21.

C. Claims On Appeal

The claims on appeal are claims 1-19 and 21.

IV. STATUS OF AMENDMENTS

There has been no amendment subsequent to the September 9, 2006 Final Rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention is applicable to a number of different industries. In the building and construction industry, for example, in order to estimate the cost of a product or project, an individual must assemble both the correct product to satisfy the engineering criteria and also the correct pricing from a variety of data sources for each component used in the assembled product. Specification at ¶0002. A tool that may be used to solve the foregoing (and other) problems can be found in the invention recited in claims 1-19 and 21. The claimed invention is directed to a system, method, or article of manufacture for configuring a product, service or even a project (e.g., group of products/services) based on disparate knowledge of the various components making up the product, service or project. Specification at ¶0003. The configuration data

output using the claimed invention provides not only an accurate assemblage of the desired product, service or project from components from disparate vendors (or other sources), but also can be used to automatically generate price quotes, CAD drawings, technical specification sheets, schedules, and other relevant reports. Specification at ¶0116.

The claimed invention is best illustrated in the exemplary context of product configuration using the automated configuration system 200 shown in Fig. 2 in accordance with a preferred embodiment of the invention. A user of the system 200 enters (using user interface 202) inputs describing a desired product configuration (e.g., door, window, or other assemblage). The inputs may be answers to a series of questions that help define the parameters (e.g., dimensions) or options (e.g., shape, color, etc.) desired in the product configuration. A frame engine 104 (Fig. 1), preferably contained within configuration subsystem 208, makes frame-based inferences of the input data based on the data in the data storage subsystem 210 and the established data relationships to build the product configuration and output data representative thereof. Specification at ¶0075.

As described in more detail in the Specification (*see, e.g.*, ¶¶0047-0050), frame engine 104 represents knowledge in a hierarchical tree-like structure. The nodes of the tree are generally called "frames," where each frame (e.g., product components, categories, etc.) contains a collection of "slots." A "slot" is a one-to-many relationship between an option and a subset of legal values (e.g., attributes) for that option. If any one slot of a frame is found to be invalid (e.g., inconsistent with user desired inputs), the entire frame for which the slot belongs is invalid. Specification at ¶0050. An important relationship in the frame-based architecture is the "inheritance" of knowledge from a parent frame to a child frame in the product knowledge tree. Specification at ¶0067. Essentially in knowledge inheritance, each frame is a parent

with children, where the children may have their own children. Children frames inherit all traits (e.g., attributes) from their parents, grandparents, great grandparents, etc., as established in the product knowledge tree. Specification at ¶0068. As shown in Fig. 31, for example, the "Buns" product category shall have all of the traits or attributes of both the "Bread" and "Groceries" categories of products. Thus, if a new type of product such as "Pumpernickel" were to be added for all types of bread, that information could simply be added to the "Bread" frame. Specification at ¶0068.

In performing frame-based inferences in accordance with the preferred embodiment, therefore, frame engine 104 marks the appropriate portions of the hierarchical tree of product knowledge invalid as the user supplies inputs concerning the desired product configuration. Specification at ¶0050. Ultimately, through the frame-based inferences performed, configuration data representing a desired configured product is output. Specification at ¶0086. From this data, accurate cost calculations can be made and detailed product information, including engineering and architecture specifications, can be obtained. Specification at ¶0086.

The use of a frame-based system in the claimed invention is fundamentally different than that of a "rule-based" system. As discussed in the Specification (*see, e.g.*, ¶¶0045-0046), a rule-based system generally represents knowledge using an antecedent-consequent format, for example, using a large collection of "If-Then" constructs ("rules"), such as "IF <condition> exists, THEN <action>." A rule-based system as used in configuration systems requires far more complex programming and data entry, and is less efficient in performing inferences. *See, e.g.*, ¶¶0045-0046 and ¶¶0053-0060. In accordance with a preferred embodiment of the invention, however, a rule-based system can be used to supplement the inferences made by the inventive frame-based configuration system. Rules engine 106, for example, may be provided to

filter the output from frame engine 104 in order to refine the ultimate output of the system (e.g., remove unwanted answers, etc.). Specification at ¶0069-0070.

Independent claim 1 is directed to a configuration system that defines the use of a "user interface" that receives "input data for a desired configuration" and "a frame engine" that "outputs configuration data to said user interface in response to a frame-based inference of the input data."

Dependent claim 3 is directed to a configuration system that supplements the "frame-engine" by subjecting configuration data to be output from the frame engine "to pertinent rules-based inferences before being output to said user interface."

Dependent claim 7 is directed to a configuration system used to configure a product based on questions answered by a user. The questions to be answered by the user are selectively presented "based on frame-based inferences made by said frame engine in response to answers input through said user interface."

Independent claim 11 contains limitations similar to claim 1. Claim 11, however, is specifically directed to a method of configuring a "project," which may involve a plurality of products, services, assemblages, or combinations thereof.

Dependent claim 12 is directed to a method of configuring a project based on questions answered by a user. Like claim 7, the method of dependent claim 12 involves the selective presentation of questions to be answered based on "frame-based inferences."

Dependent claim 16 is directed to a method of configuring a project that includes configuring a customized product by "accessing a catalog page," "accessing a custom shapes editor . . . to select a customized combination of dimensional parameters for said

product," and "accessing an accessories module containing product accessory information."

Independent claim 17 is directed to an article of manufacture having a stored control program that controls the configuration of a project similar to independent claim 11.

Dependent claim 18 is directed to an article of manufacture that represents different "configuration categories" as "frames" in a hierarchical structure, where slots of the frames correspond to configuration features and options.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-19 and 21 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,293,479 to Quintero et al. (hereinafter "*Quintero*") in view of U.S. Patent No. 5,175,795 to Tsuda et al. (hereinafter "*Tsuda*").

VII. ARGUMENT

A. The Fundamental Premise for the Final Rejection is in Error

As noted above, independent claim 1 is directed to a configuration system that includes a "frame-engine" that generates configuration data in response to a "frame-based inference" of input data. In the Final Office Action ("Office Action"), *Quintero* is relied upon to show all of the elements claimed, including the limitation "frame-based inference," except the "frame engine" element. Office Action at 2-3. The Office Action readily admits that the "frame engine" is missing from *Quintero*, but relies on *Tsuda* to provide the missing element. Office Action at 3. The Office Action concludes, "it would have been obvious [sic] a person having ordinary skill in the art [sic] the time invention was made to include the frame engine of Tsuda in the system of Quintero

because the software program function assembles the frame component to make the furniture product." Office Action at 3.

The fundamental error in the rejection of claim 1 is the misconstruction of the claim term "frame-based inference," as used in the claim. The Office Action erroneously interprets the term to mean any inference that is done on a "frame," where "frame is a basic component of furniture" (Office Action at 3). A cursory review of the application disclosure makes it clear that the *true* meaning ascribed to the term "frame-based inference" in the context of the claimed invention is that referring to the inference of configuration data achieved through examination of a hierarchical data tree-structure having nodes (known as "frames") whose components (known as "slots") contain data relevant to various configurations, as discussed above at 4.

The Office Action fails to identify anything in *Quintero* (or even *Tsuda*) that would meet the "frame-based inference" limitation, as properly construed. For this reason alone, the rejection of claim 1 (as well as the rejections of claims 2-19 and 21, which contain similar limitations) is in error and should be reversed.

Although *Tsuda* discloses the use of a "frame engine" *per se*, it is clear from a full reading of the disclosure that any inferences made by the "frame engine" utilize the classic "rule-based" structure ("IF-THEN"). *Tsuda* illustrates, for example, that the frame inference unit 102 "fetches frame *rules* filed in the frame inference knowledge filing unit 101 (501)," col. 8, lines 38-43 (emphasis added), and executes a command specified in the "THEN" portion of the rule based on satisfaction of conditions in the "IF" portion of the frame rule:

> The frame inference unit 102 fetches frame rules filed in the frame inference knowledge filing unit 101 (501), it finds the number of the frame rules and the numbers of the If-part propositions, and the Then-part propositions, of each of the frame

> rules (502), and it sets frame rule No. j to 1 (503). It checks if a respective If-part proposition of the j-th frame rule meets the states of the object world described in a frame (for example, the contents of the schedule 1 frame . . . schedule m frame in FIG. 2), and the contents of the inferred result proposition slot and inferred result certainty slots of a fuzzy frame (504).
>
> When all the If-part proposition of the j-th frame rule meet the above situation (505), the Then-part proposition No. k of the j-th frame rule is set to 1 (506), and steps 507 through 511 are executed. However, if any of the proposition is not met (505), the processing flow jumps to step 514.
>
> When the k-th Then-part proposition of the j-th frame rule is not for commencing a fuzzy reasoning (507), the Then-part proposition thereof is executed (508). When the k-th Then-part proposition is the execution of the fuzzy reasoning at step 507, steps 509-511 are completed.

Col. 8, lines 38-61. *See also* Fig. 5.

As described in detail in Applicants' Specification and summarized above (at 5), a "frame-based" inference, as disclosed and expressly recited in claim 1 (as well as in all independent claims on appeal), is fundamentally different than a "rule-based" inference utilized by *Tsuda* (and *Quintero*). Among the many advantages, the reduction of programming required, the ease of entry of new data, and increased efficiency in processing provide tremendous advantages in a configuration system that had not been even contemplated prior to Applicants' invention.

Thus, given the proper construction of the claim term "frame-based inference" it is clear that nothing in *Quintero* taken alone, or in combination with *Tsuda*, discloses (or suggests) a configuration system that utilizes a "frame-based inference" to produce configuration data, as required in claim 1 (as well as in independent claims 11 and 17). For this additional reason, the rejection of claim 1 (as well as each of claims 2-19 and 21, which require the same limitation) is in error and should be reversed.

B. Additional Limitations Recited in the Claims are Absent from Combined Teachings of *Quintero* and *Tsuda*

Dependent claim 3 (as well as dependent claims 4, 14 and 19) requires that the configuration data obtained through frame-based inferences made by the frame engine be *additionally* subjected to "rules" during a "rule-based" inference process. This process, as disclosed in the preferred embodiment of the invention, may include a separate "rules engine." *See, e.g.*, Specification at ¶0070 and "rules engine 106" in Fig. 1). Because both *Quintero* and *Tsuda* solely rely on a "rule-based" inference mechanism, they fail to disclose (or even suggest) the derivation of configuration data using a frame-based inference mechanism *followed by* a rule-based mechanism, as particularly claimed. On this issue, the Office Action can only point to the use of "rule-based inferences" in *Quintero*. Office Action at 3-4. Nothing in the Office Action is relied upon to show the specific combination of "frame-based" and "rule-based" inferences as claimed. For this reason alone, the rejection of claims 3, 4, 14 and 19 are in error and should be reversed.

Dependent claim 7 (and similarly claims 8-10 and 12-14) requires the selective output to a user of certain questions "based on frame-based inferences made by said frame engine in response to answers input" by the user. In addition to the failure to disclose any "frame-based inferences," as noted above, nothing in *Quintero* alone, or together with *Tsuda* discloses (or renders obvious) the *selective* output of questions to a user based on inferences made of previous answers input by the user. As illustrated, for example, in the preferred embodiment, *see, e.g.*, Specification at ¶0081, based on previously input answers by a user, a configuration system in accordance with the claimed invention, may remove (or even add) subsequent questions concerning the desired configuration (e.g., product, project or other assemblage). Such operation clearly increases the efficiency of the configuration process–advantages never imagined

in *Quintero* or *Tsuda*. On this issue, the Office Action merely relies on the passages in *Quintero* that describe the possible reports or other "outputs" that can be ultimately generated once a design has been completed. Office Action at 4. Nothing in *Quintero* or *Tsuda* has been relied upon to show the selective output of questions seeking *input* from the user concerning the desired configuration based on inferences made of previous user input data, as required in the claimed invention. For this reason alone, the rejection of claims 7, 8-10 and 12-14 is in error and should be reversed.

Independent claims 11 and 17 (as well as dependent claims 12-16, 18, 19 and 21) require the configuration of a "project" and not merely a single "product." As evident from a reading of Applicants' disclosure, *see, e.g.*, Specification at ¶¶0101 and 0113, configuration of a "project" involves the configuration of a group of products, services, assemblages, or combinations thereof, *not* merely a *single* product, as in *Quintero*. The Office Action does not appear to recognize the import of the "project" limitation. Instead, it merely relies on passages in *Quintero* that simply refer to the design of a single product. Office Action at 5-6. For this reason alone, the rejection of claims 11-19 and 21 is in error and should be reversed.

Dependent claim 18 (as well as claims 19 and 21) requires that "data concerning configuration of the project" be in a "hierarchical structure." In particular, data concerning different "configuration categories" for the project are represented in different "frames" that act as "nodes" in the hierarchical structure. The Office Action relies solely on *Quintero* to meet this limitation. Office Action at 4. As noted above, however, the Office Action misconstrues the term "frames" and has admitted that *Quintero* does not disclose a "frame" engine. As nothing in *Quintero* has been relied upon to show the use of a "frame," as properly construed, nor any "frame" used to represent "configuration categories," as particularly claimed, the rejection of claims 18, 19 and 21 is in error and should be reversed for this reason alone.

C. No Motivation or Suggestion to Combine *Quintero* and *Tsuda*

In the Office Action, the proposed combination of *Quintero* and *Tsuda* is made to supply to *Quintero* an explicit teaching of a "frame engine" found missing in *Quintero*. Office Action at 3. The *sole* basis for making the combination in the Office Action is "because the software program function assembles the frame component to make the furniture product." *Id.* As noted above (at 8), the term "frame" in the context of the instant application, particularly as claimed, refers to a database structure *not* a component of furniture. In view of the fact that the *sole* basis for making the combination is based on an erroneous reading of the claim language, no *proper* motivation or suggestion for combining *Quintero* and *Tsuda* can be found. The rejection of claims 1-19 and 21 is clearly in error and should be reversed on this basis alone.

In addition, as apparent from a thorough reading of *Tsuda*, the "frame engine" disclosed performs "rule-based" inferences like those performed by *Quintero*, as discussed above at 8. No motivation or suggestion has been shown to establish why one of ordinary skill in the art would be compelled to replace one "rule-based" inference mechanism, as taught by *Quintero*, with another, essentially the same, "rule-based" inference mechanism, as taught by *Tsuda*. The only clear motivating factor present in the record is that Applicants' claimed invention calls for a "frame engine," which has been conceded as lacking in *Quintero* (under any interpretation of the term "frame").

Indeed, the only clear motivation or suggestion provided by *Tsuda* is the addition of a "fuzzy" theory or "fuzzy inferences" to an existing system that stores expert knowledge in the form of "rules":

> The first object of the present invention is the provision of a system which is able to compact knowledge items, such as rules, and smoothly transplant them into a microcomputer environment.

> The second object of the present invention is the provision of a system which provides an inference which flexibly executes inferences, based on both uncertain and certain knowledge, which system thereby affords a close analog to inferencing patterns drawn by human beings.

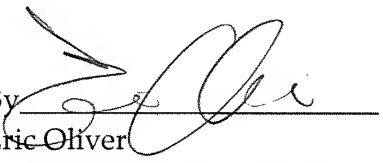
Col. 3, lines 26-35. At most, therefore, one of ordinary skill in the art would have combined *Quintero* and *Tsuda* to add a "fuzzy" inference mechanism to the "rule-based" system of *Quintero*. Such a combination does *nothing*, however, to render obvious the combination of elements specifically recited in claims 1-19 and 21. For this reason alone, the final rejection of claims is in error and should be reversed.

VIII. CONCLUSION

For each of the foregoing reasons, Appellants respectfully submit that the claimed invention is novel and non-obvious over the cited prior art. Reversal of the final grounds of rejection is respectfully solicited.

Dated: May 8, 2007

Respectfully submitted,



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APPENDIX A – CLAIMS APPENDIX

Claims Involved in the Appeal of Application No. 10/669,465

Claim 1 (original): A configuration system comprising:

a user interface, wherein said user interface receives input data for a desired configuration; and

a frame engine, receiving data input from said user interface, wherein said frame engine outputs configuration data to said user interface in response to a frame-based inference of the input data.

Claim 2 (original): The system of claim 1, further comprising a database, coupled to said frame engine, storing configuration data selectively retrieved for output in response to inferences made by said frame engine.

Claim 3 (original): The system of claim 2, wherein said frame engine subjects configuration data to be output to said user interface to pertinent rules-based inferences before being output to said user interface.

Claim 4 (original): The system of claim 3, further comprising a rules engine, coupled to said frame engine, wherein said rules engine subjects selected configuration data to be output to said user interface to pertinent rules-based inferences before being output to said user interface.

Claim 5 (original): The system of claim 2, wherein said frame engine represents data concerning configuration in a hierarchical structure, with frames corresponding to configuration categories, wherein the frames act as nodes of the

hierarchical structure containing a collection of slots corresponding to configuration features and options.

Claim 6 (original): The system of claim 5, wherein said database stores data representative of product knowledge pertaining to products that may be configured by the system.

Claim 7 (original): The system of claim 2, wherein said database stores a plurality of questions for selective output to said user interface based on frame-based inferences made by said frame engine in response to answers input through said user interface.

Claim 8 (original): The system of claim 7, further comprising:

a data analysis subsystem performing analysis of configuration data to be output to said user interface; and

a graphics formatting output subsystem providing graphical representations of configuration data output to said user interface.

Claim 9 (original): The system of claim 8, wherein said data analysis subsystem comprises a pricing engine providing pricing data corresponding to configuration data output to said user interface.

Claim 10 (original): The system of claim 8, wherein said graphics formatting output subsystem comprises a parametric drawing engine providing illustrations of configuration data to said user interface.

Claim 11 (original): A method of configuring a project, the method comprising the steps of:

accessing a user interface;

initiating a project for configuration;

configuring the project by entering project selections;

performing a frame-based inference in response to project selections made in said configuring step; and

outputting project configuration data to the user interface based on inferences made in said performing step.

Claim 12 (original): The method of claim 11, wherein said configuring step involves answering a plurality of questions presented, wherein the questions to be presented during said configuring step are stored in a database and selected for presentation based on inferences made in said performing step.

Claim 13 (original): The method of claim 12, wherein said configuring step further comprises the substep of presenting preferred answers to select questions presented on the user interface.

Claim 14 (original): The method of claim 12, wherein said performing step further comprises the substep of performing a rules-based inference in response to project selections made in said configuring step.

Claim 15 (original): The method of claim 11, wherein said configuring step further comprises the substeps of:

graphically selecting parameters to configure the project based upon graphic representations of variations of characteristics of components to be selected for the project; and

manipulating schematically configured illustrations of components to be selected for the project.

Claim 16 (original): The method of claim 15, wherein the project to be configured includes a custom product, the method further comprising the steps of:

accessing a catalog page to display graphical and textual information pertinent to the product to be configured;

accessing a custom shapes editor to size a product upon configuration and to select a customized combination of dimensional parameters for said product;

accessing an accessories module containing product accessory information; and

producing technical specifications containing technical information regarding the project as configured;

Claim 17 (original): An article of manufacture comprising a machine-readable storage medium having stored therein indicia of a plurality of machine-executable control program steps, the control program comprising the steps of:

accessing a user interface;

initiating a project for configuration;

configuring the project by entering project selections;

performing a frame-based inference in response to project selections made in said configuring step; and

outputting project configuration data to the user interface based on inferences made in said performing step.

Claim 18 (original): The article of manufacture as recited in claim 17, wherein said performing step comprises the substep of representing data concerning configuration of the project in a hierarchical structure, with frames corresponding to configuration categories, wherein the frames act as nodes of the hierarchical structure containing a collection of slots corresponding to configuration features and options.

Claim 19 (original): The article of manufacture as recited in claim 18, wherein said performing step comprises the substep of subjecting selected configuration data of the project to pertinent rules-based inferences.

Claim 20 (withdrawn).

Claim 21 (previously presented): The article of manufacture as recited in claim 18, wherein the substep of representing data concerning configuration of the project in a hierarchical structure comprises organizing nodes in parent node and child node relationships, wherein each child node inherits attributes of a respectively associated parent node.

APPENDIX B – EVIDENCE APPENDIX

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

APPENDIX C – RELATED PROCEEDINGS APPENDIX

No related proceedings are referenced in II. above, hence copies of decisions in related proceedings are not provided.